

Notice of Allowability

Application No.

10/776,855

Examiner

Barbara Summons

Applicant(s)

HUYNH, NGOC-HOA

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.
2. ☒ The allowed claim(s) is/are 1-15.
3. ☒ The drawings filed on 11 February 2004 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 2/11/04 & 9/3/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

REASONS FOR ALLOWANCE

1. The following is an examiner's statement of reasons for allowance:

The prior art of record does not disclose or fairly suggest a thin film resonator (FBAR) ladder filter or duplexer comprising such a ladder filter, comprising each of the specifically recited features and especially having "at least one capacitor element including an upper metal electrode and a lower metal electrode" that is "serially coupled between two ground nodes", wherein each ground node is an "upper metal ground electrode" of a "shunt-coupled FBAR element" (see e.g. claim 1, lines 4-8 and claim 10, lines 12-16). The prior art of record also does not disclose or fairly suggest a method of grounding a ladder filter comprising each of the specifically recited features, and especially "connecting between the upper grounding electrodes of at least two adjacently shunt-coupled FBAR elements a capacitor element" (see claim 13, lines 6-7 and claim 15, lines 7-11). The prior art references of record cited by the Examiner are discussed below.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tikka U.S. 2004/0124952 appears to be the closest prior art of record and discloses a ladder filter with FBAR resonators and capacitors C1 and C2 (see Fig. 4) serially connected between the parallel resonators. However, as is described in the specification regarding Fig. 3 (see sections [0039]-[0041]), the capacitors are formed by the lower electrodes of the parallel resonators PR1 and PR2, and by a metal layer of the acoustic mirror Hz2 underlying the resonators, and so is not connected between an "upper ground electrode" of two parallel/shunt resonators.

Ruby et al. U.S. 6,472,954 discloses forming a capacitor 134 (Fig. 9) on the same die as a ladder filter with FBAR resonators. However, as shown in Fig. 8, the capacitor is connected in parallel to an individual FBAR resonator so it is not serially connected between the ground electrodes of two parallel resonators.

Similarly, Klee et al. U.S. 6,653,913 also discloses capacitors in parallel with individual FBAR resonators in a ladder filter.

Kushitani et al. U.S. 2004/0085161 discloses the recited arrangement of a capacitor 26 (Fig. 1) between the ground electrodes of two resonators 17 and 18 of a ladder filter. However, the ladder filter uses surface acoustic wave (SAW) resonators. It should be noted that FBAR resonators are known electrical equivalents of SAW resonators in the acoustic resonator art, but replacing the SAWs with FBARs still would not guarantee that the capacitor would be connected between upper ground electrodes as required by each of the independent claims (see each of claim 1, lines 4-8; claim 10, lines 12-16; claim 13, lines 6-7; and claim 15, lines 9-11).

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3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bs
May 12, 2005



**BARBARA SUMMONS
PRIMARY EXAMINER**